



# Global POPs and Mercury UNEP Findings and Activities

For

## Workshop on Long Range Transport of Toxic Substances to the Great Lakes

Ann Arbor, Michigan USA

Paul Whyllie  
UNEP Chemicals

September 16-17, 2003



# Global POPs and Mercury: UNEP Findings and Activities



Discussion reserved to four activities:

- ❖ Regionally Based Assessment of Persistent Toxic Substances
- ❖ Global Mercury Assessment
- ❖ National Implementation Plans
- ❖ Global Monitoring of POPs



# RBA PTS PROJECT



## ■ Objective of the Project

- ❖ To deliver a measure of the nature and comparative severity of damage and threats posed at national, regional and ultimately at global levels by PTS

September, 2003

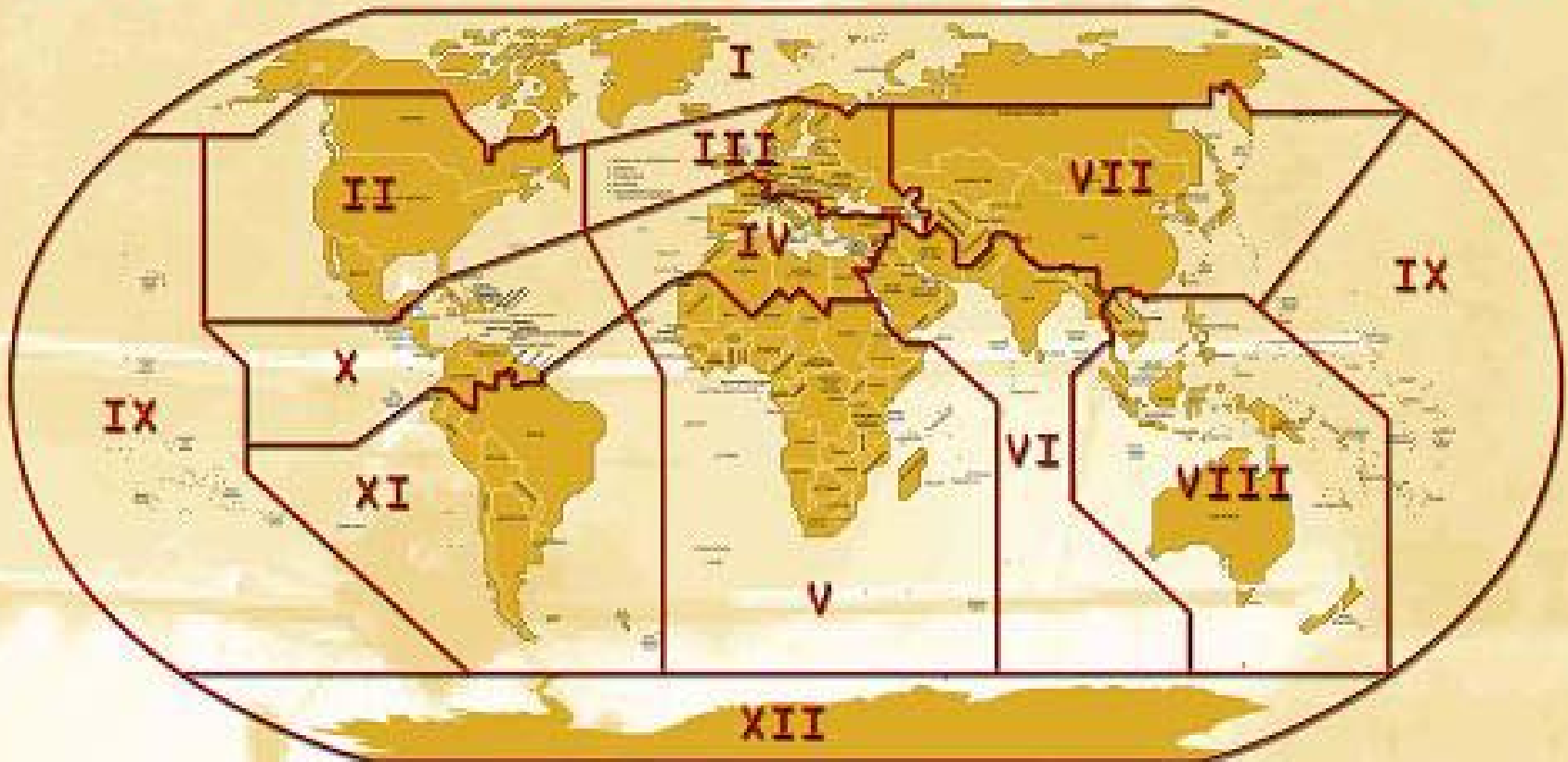


# RBA PTS PROJECT



Globe divided into 12 regions

## MAP OF THE GEOGRAPHICAL REGIONS OF ASSESSMENT





# RBA PTS PROJECT



## ■ **Methodology employed**

- ❖ Steering Group to monitor project implementation
- ❖ Regional Teams coordinated assessment
- ❖ Over 15,000 questionnaires filled
- ❖ 52 Technical Workshops and Meetings
- ❖ 10 Priority Setting Meetings
- ❖ 12 Regional Reports completed



# RBA PTS PROJECT



## ■ Regionally Selected Chemicals

- ❖ Hexachlorocyclohexanes (HCH, lindane)
- ❖ Polycyclic aromatic hydrocarbons (PAHs)
- ❖ Endosulphan
- ❖ Pentachlorophenol (PCP)
- ❖ Organic mercury compounds
- ❖ Organic tin compounds
- ❖ Organic lead compounds
- ❖ Phthalates



# RBA PTS PROJECT

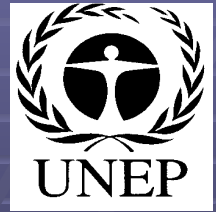


## ■ Regionally Selected Chemicals

- ❖ Polybrominated diphenyl ethers (PBDE)
- ❖ Chlordecone
- ❖ Octylphenols
- ❖ Nonylphenols
- ❖ Atrazine
- ❖ Short chain chlorinated paraffins (SCCPs)
- ❖ Perfluorooctane sulfonate (PFOS)
- ❖ Hexabromobiphenyl (HxBB)



# RBA PTS PROJECT



- **Priority Source Issues**
- Obsolete stocks and reservoirs of pesticides

- Region 3 ~ 80000 tonnes
- Region 5 ~ 120000 tonnes
- Other regions ~ 50000 tonnes
- Total ~ 250000 tonnes

Does not include contaminated sites



September, 2003





# RBA PTS PROJECT



## ■ Priority Source Issues - POPs

### ■ Stocks/Use of PCBs



Some 1.7million tonnes produced historically



Transformers, capacitors, hydraulic fluids, stored drums....healing oils!?

September, 2003



# RBA PTS PROJECT



## ■ Priority Source Issues - POPs



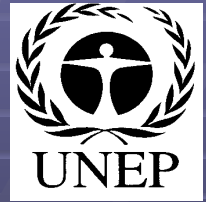
### ❖ Industrial emissions of PCDD/PCDFs

- ❖ Releases to air from 21 developed countries ~ 20000g I-TEQ
- ❖ Globally ? More work to be done

September, 2003



# RBA PTS PROJECT



## ■ Priority Source Issues - POPs

- Emissions of PCDD/Fs & PAHs from open burning



Chilean forest fire produces thick black smoke that fills the sky. The fire is burning in a forest near the town of Valdivia, Chile. The fire is burning in a forest near the town of Valdivia, Chile. The fire is burning in a forest near the town of Valdivia, Chile.



A person is using a long-handled tool to manage a large fire burning in a field. The fire is burning in a field near the town of Valdivia, Chile. The fire is burning in a field near the town of Valdivia, Chile. The fire is burning in a field near the town of Valdivia, Chile.



A large pile of waste material, including plastic and metal, is burning in a field. The fire is burning in a field near the town of Valdivia, Chile. The fire is burning in a field near the town of Valdivia, Chile. The fire is burning in a field near the town of Valdivia, Chile.

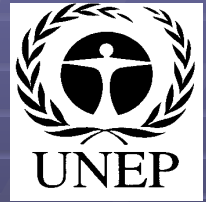


A large fire burning in a field, with thick black smoke rising into the sky. The fire is burning in a field near the town of Valdivia, Chile. The fire is burning in a field near the town of Valdivia, Chile. The fire is burning in a field near the town of Valdivia, Chile.

- ✚ Dumps, crops, backyard waste, forest fires, carcass disposal....
- ✚ Could constitute > 50% of global emissions – precise measurements and estimates difficult



# RBA PTS PROJECT



## ■ Priority Source Issues - POPs



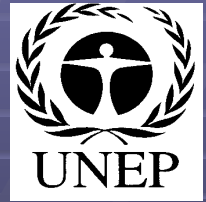
© DDT use

- ▲ ~ 15-20000 tonnes produced annually
- ▲ Malaria vector control, agricultural use....?
- ▲ Concentrations range 1-1000mg/L in freshwaters
- ▲ Detected throughout all regions in soil (<106mg/kg)

September, 2003



# RBA PTS PROJECT



- **Priority Source Issues – Emerging chemicals**
  - Intentionally produced chemicals



- ❖ PBDEs, PFOS, SCCPs, phthalates, alkylphenols, HxBB.....many unanswered questions



# RBA PTS PROJECT



## ■ **Priority Environmental Issues – POPs**

- ❖ Some residues of PTS pesticides constant or increasing in the polar regions...., PCBs, HCHs, Toxaphene > DDT, chlordane, 'drins, HCB...dependent on compartment of the environment .



September, 2003



# RBA PTS PROJECT



- **Priority Environmental Issues – POPs**

- PCBs continue to show  in developing countries







# RBA PTS PROJECT



## ■ Priority Environmental Issues

### ■ Pesticide chemicals in use

❖ Lindane, endosulphan, atrazine

Found increasingly in many environmental compartments



September, 2003





# RBA PTS PROJECT



## ■ **Priority Environmental Issues**

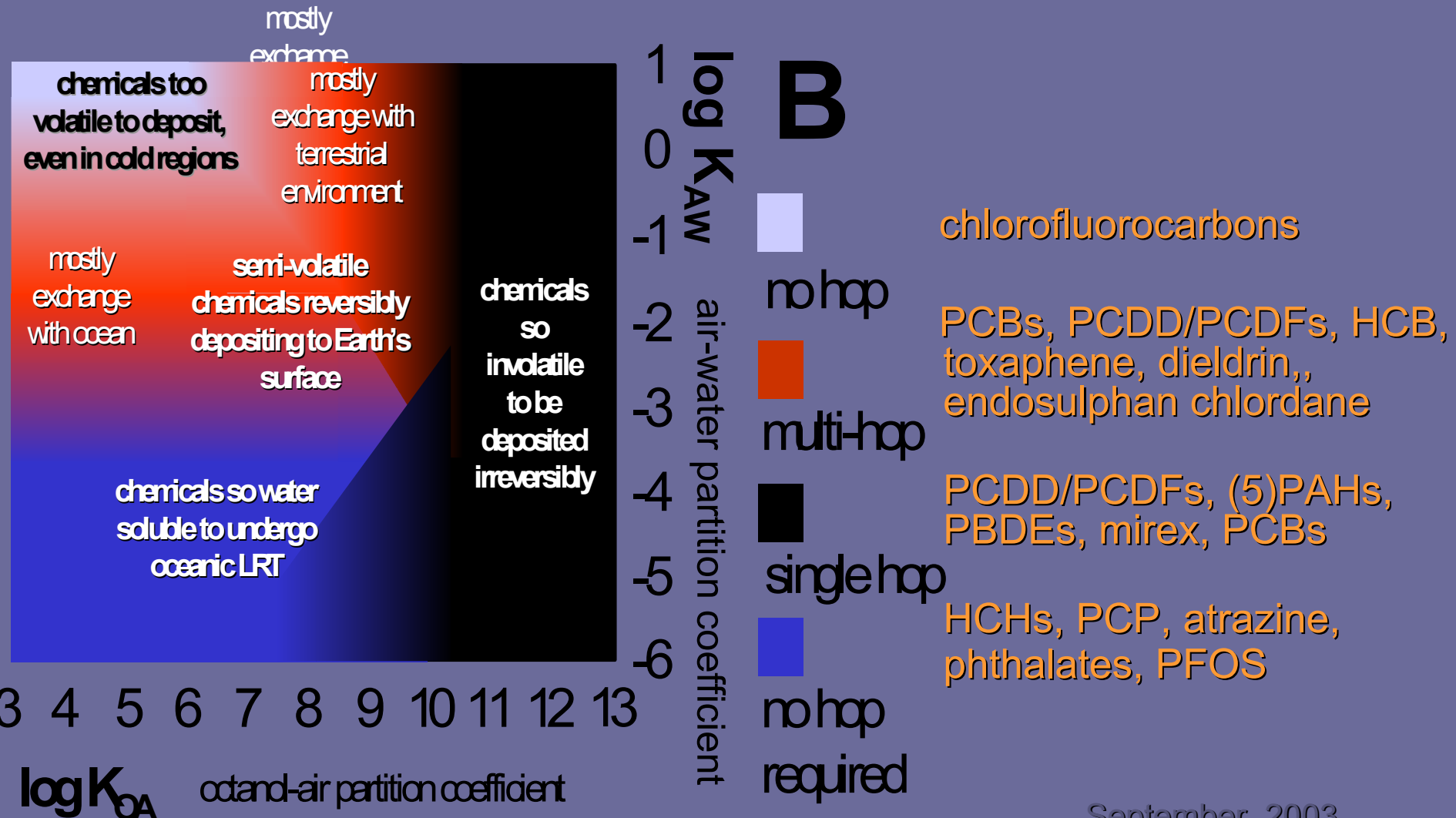
data gaps   data gaps   data gaps

- PCDD/Fs, PBDEs, SCCPs, PCP, nonyl/octylphenols, PFOS, HxBB, Phthalates, Org. metal compds.
- ✦ Global source profile required
- ✦ Strategic global monitoring
- ✦ Transparent network to include industry



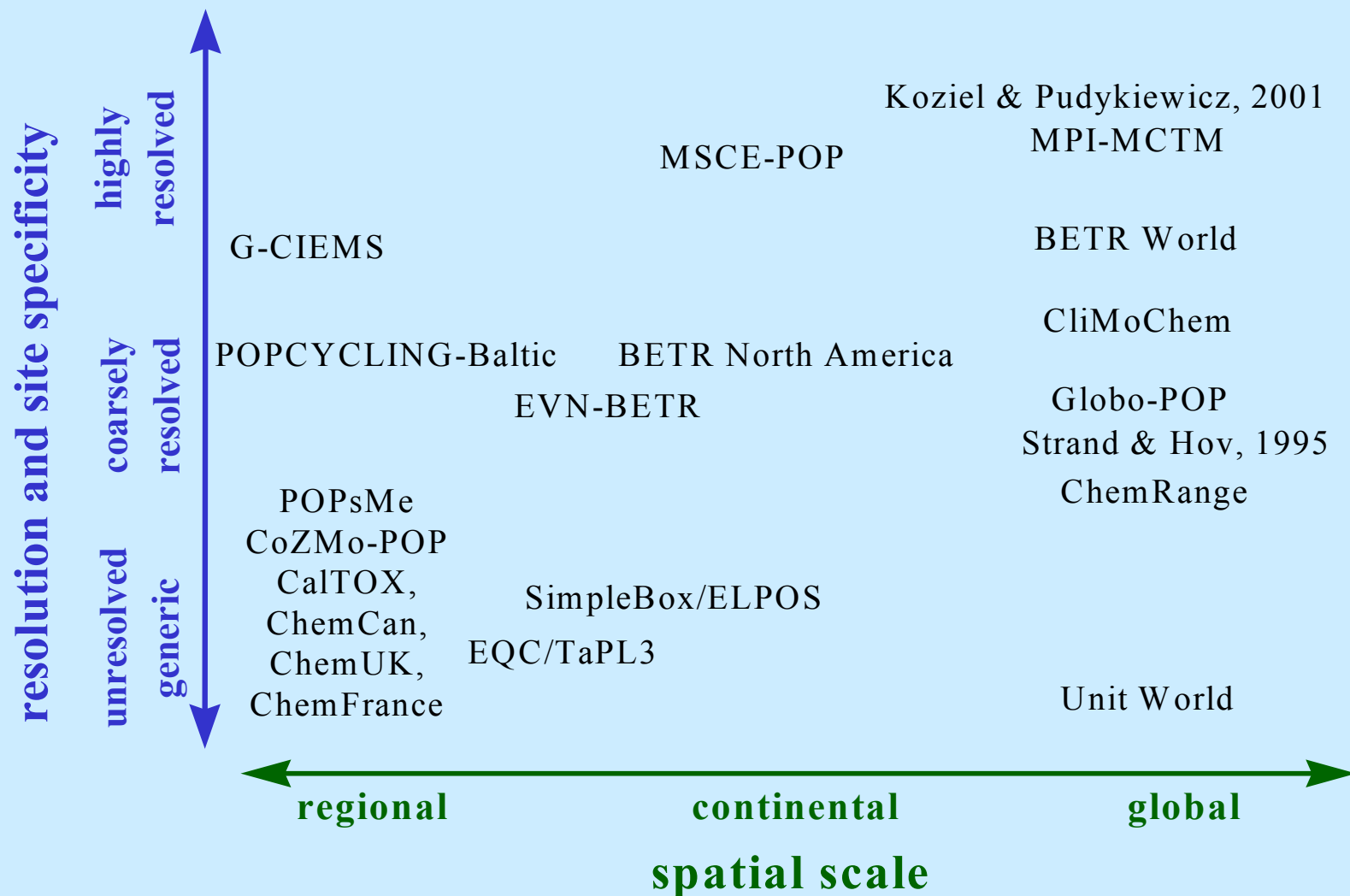


# RBA PTS PROJECT





# RBA PTS PROJECT





# RBA PTS PROJECT



## Root causes of PTS

- ❖ Persistence
- ❖ Low water solubility
- ❖ High toxicity
- ❖ Unsustainable production/consumption
- ❖ Cost of chemicals
- ❖ Perceived effectiveness
- ❖ Ignorance



# RBA PTS PROJECT

## Barriers to solutions

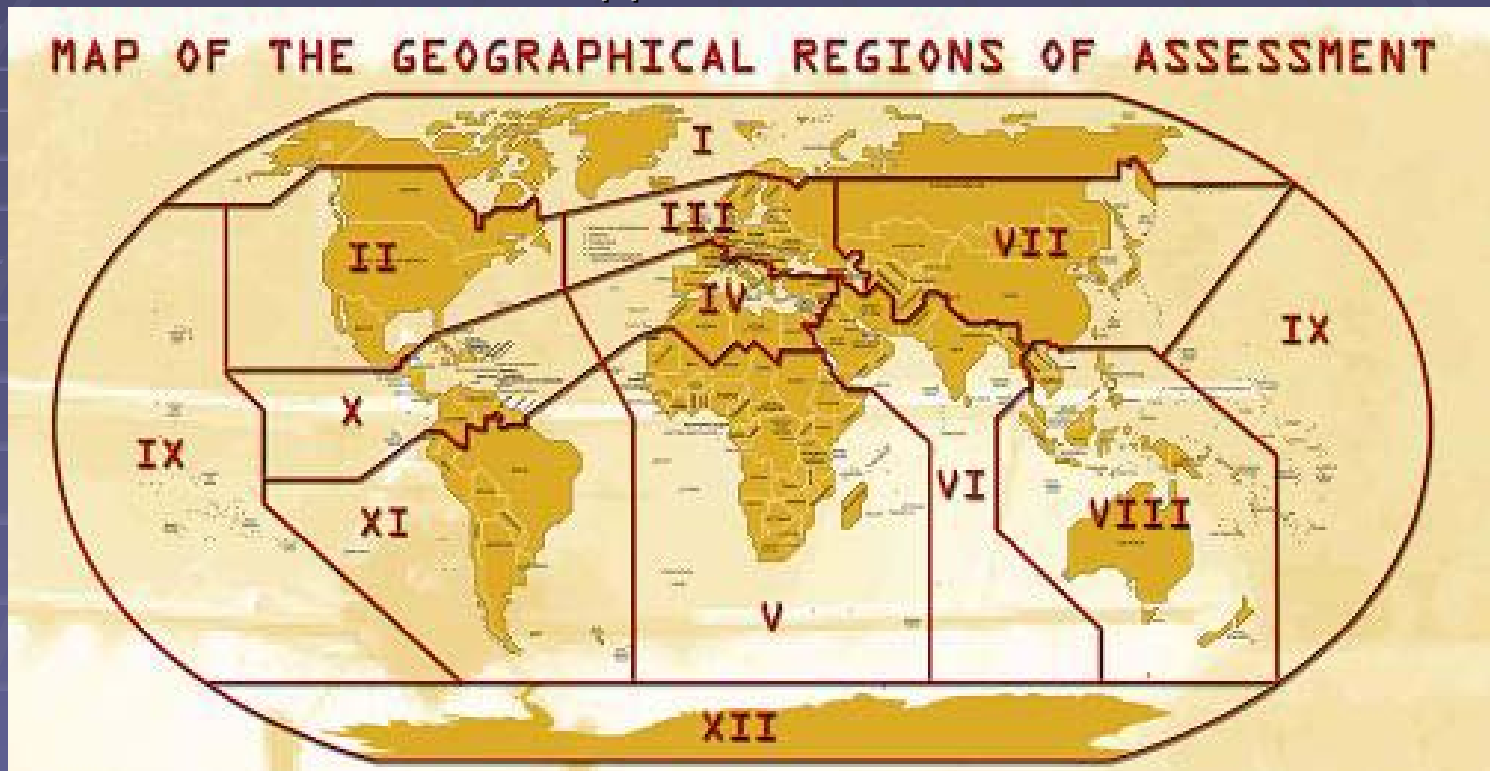
- ❖ Lack of scientific data
- ❖ Lack of monitoring and inventory capacity
- ❖ Lack of suitable legislative framework
- ❖ Ineffective enforcement of regulations
- ❖ Illegal trade and inappropriate use
- ❖ Lack of awareness, information and coordination
- ❖ Commercial pressures
- ❖ Lack of financial resources
- ❖ Lack of availability and acceptance of alternatives



# RBA PTS PROJECT



Developed capacity, regulation and enforcement  
II, III, upper IV, VII, Australia



Undeveloped capacity, regulation and enforcement  
XI, X, IX, VIII, VI, V, lower IV

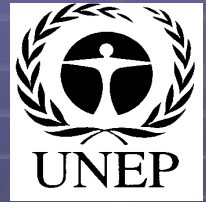


# RBA PTS PROJECT



## POPs related Recommendations

- ★ Ratification of International Environmental Conventions
- ★ Global strategy for Implementation of NIPs
- ★ Global strategy for elimination of DDT use for malaria control



# RBA PTS PROJECT

## General Recommendations

- ① Update of RBA PTS
- ② Filling of data gaps
- ③ Assessment of open burning as a source of PTS
- ④ Creation of a resource centre for new PTS chemicals
- ⑤ A global strategy for increasing public awareness
- ⑥ Production of a global source profile
- ⑦ Establishment of a global strategy for technology transfer
- ⑧ Development of capacities for determining the LRT of PTS





# UNEP Global Mercury Assessment

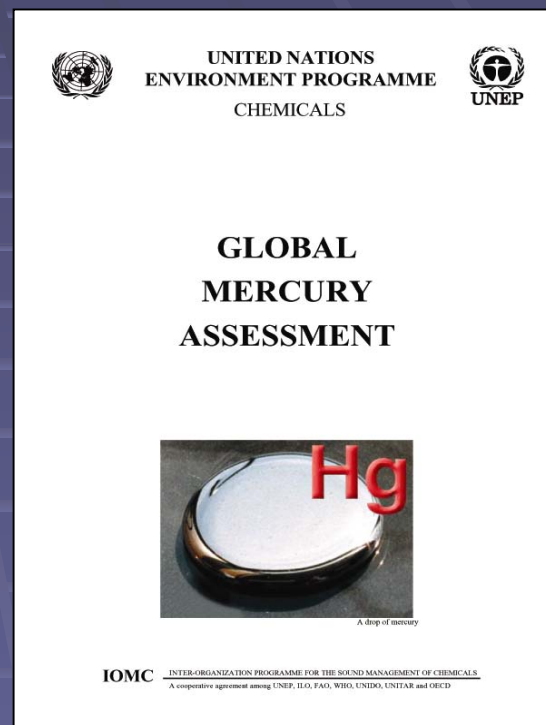


- Why a global assessment of mercury?
- Why is mercury a global issue?
- What is being done at international level?



# Why a global assessment of Hg?

- Initiated by UNEP Governing Council in 21<sup>st</sup> session (2001)
- Concerns raised in different fora that national/regional action not sufficient to resolve problems within borders



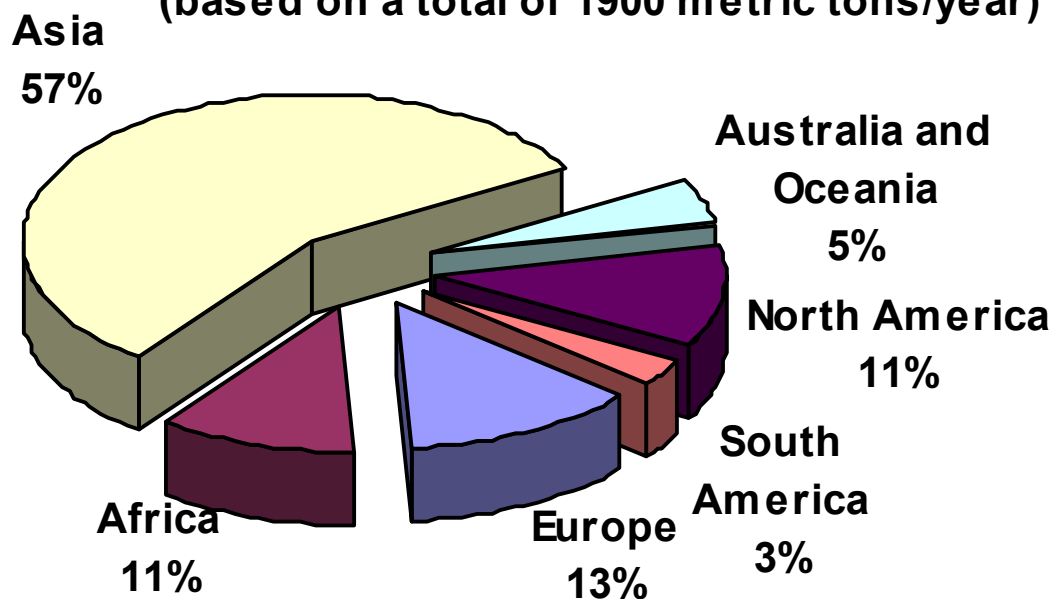
September, 2003



# Global cycling of mercury increases the problem

## Estimate of global atmospheric releases of mercury by region (1995)

(based on a total of 1900 metric tons/year)





# Global cycling of mercury increases the problem

- Anthropogenic activities -  $\uparrow$  levels of Hg 3-fold since pre-industrial times.
- Fossil fuels/incineration of waste ~70 % of global emissions.
- .Estimated 13 million miners - supporting 100 million people
- Estimates of Hg released from mining ~ 300 -1000 metric tons/year



September, 2003



# UNEPs mercury programme

- In the short term:
  - Build inventory of uses and releases
  - Identify populations at risk
  - Monitor mercury levels
  - Develop action plans to deal with problems
  
- In the long term:
  - Encourage and support implementation of national and regional action plans to deal with problems
  - Support and facilitate discussion on further actions to be undertaken



# Support for the programme

- Need financial contributions from countries to finance UNEP's mercury programme
- Mobilize bilateral and multilateral funding for projects in developing countries
- The US has already supported previous activities with both financial resources and technical expertise/knowledge



September, 2003



# Overview of National Implementation Plans

Under the Stockholm Convention on POPs



# Concept



- What is a NIP?
- Instructed under the Stockholm Convention – Article 7
  - ✧ A planning document explaining how the commitment made will be addressed:
    - ✓ identifies country situation
    - ✓ sets priorities for initiating future activities to protect health and environment from POPs
    - ✓ provides framework for a country to develop and implement priority policy and regulatory reform, capacity building and investment programmes





## How? -- resources



- GEF will provide funds to cover the agreed full cost, up to a maximum of US\$500,000 per country, for enabling activities using the expedited procedure.
- Requests for more than US\$500,000 will be considered on a case-by-case basis, but will be processed under the normal procedure (PDF-B)



# Building experience: The 12 country pilot project



- A learning process for broad application
- Basis for the GEF initial guidelines
- Will test and complement generic and technical guidelines for the development of NIPs and the adoption of POPs management options (lessons learned)



# The 12 Countries





# Draft framework for Stockholm Convention NIPs

- Five step process
  - ① Coordination and organization
  - ② Inventory of POPs & infrastructure
  - ③ Priority setting
  - ④ NIPs and NAPs formulation
  - ⑤ Endorsment
- Process proposed by expert group & reviewed in 4 regional workshops



# POPs Global Monitoring Programme



- General lack of data on chemicals levels in the environment
- Adequate monitoring limited to OECD countries, Arctic, Baltic, North Sea, Great Lakes
- Analysis, evaluation and assessment of threats from individual chemicals difficult without sufficient data
- Monitoring needed for effectiveness evaluation of measures taken under Stockholm Convention according to Article 16



# POPs Global Monitoring Programme



- Workshop to Develop a POPs Global Monitoring Programme to Support the Effectiveness Evaluation of the Stockholm Convention on POPs held in Geneva, Switzerland, 24-27 March 2003
- Objective: Develop guidance for a POPs Global Monitoring Programme for consideration by the POPs INC7 in June 2003



# POPs Global Monitoring Programme



Working groups were held on:

- Assessment needs for the Stockholm Convention
- Substances and analytical techniques
- Sample Matrices, Site Selection and Sampling Techniques
- QA/QC and Data Treatment
- Data Communication



# POPs Global Monitoring Programme



The workshop proceedings are available on the GMP website:

<http://www.chem.unep.ch/gmn/default.htm>





# POPs Global Monitoring Programme



## Next steps:

- Expert consultation to develop a guidance document for a POPs GMP
- Testing guidance document in a pilot region
- Development of an inventory of laboratories



# UNEP Findings and Activities



- ★ RBA PTS Project
- ★ UNEP mercury programme
- ★ Stockholm Convention NIPs
- ★ Global monitoring programme

*Thank You*